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MADRAS RECORD OFFICE.

Government of Madras.

Public works **DEPARTMENT.**

G.O. No. 240	Press / Mis.
463-64	
Dated 21 1	1870.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, 21st January 1870.

No. 463. Read the following Proceedings of the Madras Government in the Public Department.—

Passing orders on the Sanitary Commissioner's letter, submitting certain suggestions relative to the water supply, drainage, and general conservancy of the Lawrence Asylum at Lovedale on the Neilgherries } (Here enter 4th January 1870, No. 5)

No. 464. ORDER THEREON, 21st January 1870, No. 240.

MILITARY WORKS, No 11.

COMMUNICATED through the Superintending Engineer of the 7th Division to Lieutenant-Colonel Farewell who will submit the requisite approximate estimates.

(True Extract.)

Colonel, R.E,
Secretary to Government.

To the Superintending Engineer, 7th Division.

No 9. Read the following letter from Surgeon-Major J. L RANKING, Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George, dated Madras, 4th December 1869, No. 3323.

The near approach to completion of that noble institution the "Lawrence Asylum" at Lovedale, Ootacamund, and the prospect of transferring to it early next year the whole of the lads from the parent institution at Madras, render it desirable that the attention of Government should be directed towards the perfection of the sanitary conditions connected with water supply, drainage, and general conservancy, and I venture to offer a few remarks and suggestions upon these several points.

2 WATER SUPPLY.—The water supply at present available is derived from a small impounding reservoir at some distance from the Asylum, and in a locality far removed from any probable sources of contamination. From this reservoir the water is brought in an open channel of about three miles in length, which, near the Asylum, divides into two branches, one leading to a well or reservoir, situated beneath the plateau upon which the Female branch of the Asylum is to be erected, and whence it is raised for distribution by steam power, the other to an open masonry tank or reservoir near the workshops (now converted into a Jail) from which it is raised for distribution by a common pump

3. This supply is limited. The impounding reservoir is not supposed to be of a capacity equal to storage of a supply sufficient for the whole wants of the institution when fully occupied. Captain Morant expressed an opinion in conversation with me that it might possibly be increased to a sufficient volume by raising the embankment of the reservoir, but Colonel Farewell has his doubts upon this point, and questions whether a sufficient supply could be stored even by this means during the dry season Hence it has from the first been contemplated to derive the water supply from another source, the tank or pond situated to the right of the mainroad from Coonoor to Ootacamund below the property known as Burnfoot. From this piece of water the supply is to be led by a natural water-course to a second small impounding reservoir, the stone-embankment of which has already been built, and thence again by an open made channel to the foot of the buildings where it is to be raised, the lift being of considerable height (80 to 100 feet) to the plateau. Now if this scheme is examined in all its features, and with reference to the principles of water supply essential to safety in a sanitary point of view, it will be found that a pure supply fit for drinking and domestic purposes can scarcely be obtained from this source

In the first place the impounding reservoir is not a pure source of supply The piece of water has been used largely for long periods for watering and washing cattle; the slopes of portions of the gathering grounds are under cultivation in which manure is largely used, and there are indications of extension of cultivation, while on the northern slopes a small village is situated, the drainage from which finds its way into the tank. But the water as it flows from the tank along the natural channel towards the second small impounding reservoir is liable to further contamination from the same cause, manuring of the southern hillsides which are under tea cultivation, while at the small impounding reservoir itself a state of affairs exists of the most objectionable character as further affecting the purity of the supply.

4. This small reservoir is situated close to a house or farm belonging, I believe, to Mr. James Close to this and to the reservoir a row of cooly huts has been built and attached to them, and upon the very verge of the reservoir a pit for the reception of refuse of all kinds, dung, &c, has been dug It is impossible that, under these conditions, the water can escape the most serious and dangerous contamination. The margin of the reservoir will be resorted to for all those filthy processes for which natives are notorious, while the liquid contents of the filth pit will leak into the reservoir itself.

Colonel Farewell brought these circumstances to my notice, and I do not think the risk of contamination of water can be overstated The ground upon which the cooly huts have been erected is, I understand, Government property, so that the evil may be remedied

But independent of this element of contamination, I do not think that this source of supply should be used, except for bathing and ablution purposes. It will, I consider, be unsafe to trust to it for the supply for drinking and cooking Colonel Farewell is quite of the same opinion, and contemplates retaining the present supply referred to in paragraph 2 for the latter purposes.

5 I think, therefore, that it should be at once determined whether it is possible to make the present supply suffice for all the wants of the institution, and that the supply itself should be furnished under all the precautions and upon the principles now recognised in Europe, and which have recently been pressed upon the attention of Government in the Despatch, No. 12 (Sanitary) of the 24th June, from the Right Honourable the Secretary of State for India, published in Proceedings of Government, No. 1169, of 19th August These are, 1st, that the impounding reservoir should be strictly conserved, the gathering grounds be kept from the intrusion of cattle, and especially from cultivation or the growth of rank vegetation, 2nd, that the water should be conveyed by pipes to the reservoir whence it is raised to the plateau for distribution; 3rd, that here a filter and covered clear-water cistern ("closed service reservoir") should be constructed, and the water distributed to all parts of the building by pipes.

6. To determine the quantity of water that will be required to meet all the wants of the institution it is necessary to consider what those wants are, and they may be stated to be a supply for drinking, cooking, ablution, swimming baths, laundry work, and sewerage.

It is a question whether the swimming-baths on the plateau may not be abandoned, not only without detriment to the health and comfort of the inmates of the institution, but with advantage both on sanitary and economic grounds

I submit for consideration that arrangements for bathing and swimming may be best made at the small artificial lake at the foot of the plateau, and that the short walk to and from the bath will conduce to health. If this be conceded a large outlay would be saved in the provisions of the water supply.

7 Laundry Work.—I do not know what system will be followed in the Laundry Department; whether the clothing will be washed at the institutions, or whether it will be done, as is usual in this country, by contract. At any rate if a Laundry Establishment is to be associated with the institution, I think it also might

with advantage be at a short distance from the buildings, and the tail of the lake or the piece of water just referred to appears to be a suitable site for it, the water available being that discharged over the weir.

If this suggestion be approved the water supply required on the plateau will be limited to drinking, cooking, ablution, and for flushing drains, and the amount for these purposes may be calculated. Estimating the population at 800 which is, I have ascertained, to be the number for whom water must be provided in the two branches of the Asylum, including masters and establishment, the following daily provision must be made —

	Rs
For drinking and cooking, at two gallons per head	1,600
For ablution and house cleansing, at four gallons per head	3,200
For flushing drains say at six gallons*	4,800
Total	9,600

If the estimate be raised to say fourteen gallons per head it will be 11,200 gallons per diem, which, I think, with the arrangements I have suggested for bathing, will amply suffice Possibly also an allowance must be made for the workshops in which the lads will work at different trades—an addition of 4000 gallons would meet this, or, say, 11,000 gallons in all

I would suggest that Colonel Farewell be called upon to report upon this question, and to estimate the expense, bearing in mind the necessity of duly considering all the precautions against contamination, and the principles necessary to, and inseparable from, constant purity of supply, in storage, filtration, and distribution The expense of bringing the Burnfoot supply to the plateau, should it be determined to construct the swimming-baths there, might also be estimated so that the economic bearings of the single and double supply may be clearly shown. In this case the supply of water for drinking and cooking only would be 1600 gallons

It must, I think, be at once accepted that the Burnfoot supply will not do for drinking and culinary purposes That must be brought from the reservoir referred to in paragraph 2.

8. Improvement of the ablution accommodation —I now proceed to consider the arrangements made for ablution which are, in my judgment, not only capable of improvement both in a sanitary and economic respect, but demand improvement The ablution rooms consist of large well-lighted and ventilated buildings down the centre of which are arranged a double row of metal basins thirty in number. The water supply is kept in a number of eighteen half casks, each of which has to be filled by hand at considerable labour, and from which the boys fill their basins The only way of disposing of the soiled water is by emptying the basins upon the floor which is asphalted, sloping at each end towards the centre where a shallow gutter exists for the escape of the refuse waters from the building This floor is always wet and sloppy

Should the Government approve of the suggestions I have made for the water supply, I would advise that water be laid on to the lavatories by pipes and cocks The latter to prevent wastage should be what is termed "careless" cocks, and of course

* This will depend upon the diameter and gradient of the sewer.

strong and durable to guard against injury. The basins should also be furnished with holes, plugs, and waste pipes The pipe for supply, with branch pipes to the basins, should be of iron, as it is quite possible that the lads may not unfrequently drink from the taps, but the waste-water pipe may be of lead.

But even if the water be not laid on by gravitation to the whole building as I have suggested, it would be a great saving of labour if it could be supplied to a high level reservoir outside the ablution room, and thence be distributed to the basins.

I think it also very desirable that a masonry cistern should replace the half casks now used within the building, and that means should be provided for the boys performing ablution of the entire body (or of the person after resort to the latrines—a practice they should be encouraged to follow) in privacy To this end I would advise that small cisterns be built at either end of the building and enclosed by a low screen—such cisterns to be furnished with discharge pipes communicating with the general drainage system of the institution now to be considered

9. Drainage and Sewerage.—Due provision has been made for the ordinary drainage of the plateau for carrying off storm waters, but no system of sewerage has, I believe, been planned. The latrines are conserved upon the dry-earth principle, and the system, as enforced, is perfect so far as sanitary requirements are concerned. Whether it is the most economical is another question. The urinaries are enamelled vessels with waste pipes carrying off the urine to a tub placed outside the building, the contents of which are disposed of by hand. Waste waters from ablution rooms are carried off by covered drains leading into the storm-water drains, and those from kitchens, scullieries, and masters' quarters, are received into vessels, and removed by hand

10 Of liquid refuse by tubular drains.—It is very desirable that provision should be made for removal of the urine and refuse waters by a complete and independent system of under-ground drainage by glazed earthenware pipes of the description known as Jenning's patent chair and saddle-pipes. The amount of piping required for effectual drainage of the institution would be but small; an out fall can be found with any gradient desired, and in close proximity to the Asylum; and the sewage can be utilized if required, and should be so utilized in garden cultivation Tubular drainage will, in the end, I believe, be found the most economical; but independent of this, it is most desirable that this noble institution, destined to become probably for ages the home of so large a number of the children of our European soldiers, should be furnished with all the means necessary to secure the soil upon which it is constructed from pollution by removing at once from it liquid refuse of every kind.

11. Urinaries.—In regard to the urinaries, I have also to advise that, in connexion with the water-supply scheme recommended, pipes should be laid on admitting of a continuous flow of a small stream of water into the urinals so as to keep them and their discharge pipes constantly washed out. An odour of urine now pervades the urinaries, but this provision would prevent it.

12 Night closets attached to the Dormitories.—In regard also to the small night closets attached to the different dormitories, some improvements are advisable The only provision made for night use is the introduction of two or three ordinary

chamber utensils. The consequence is that slopping occurs, and the floorings which are boarded will more or less be saturated with urine, and have already in some instances become so soiled Each of these rooms might have a urinal erected in it similar to those now in use in the general urinary, and supplied with water and waste pipe leading to the closed drains If water cannot be laid on to the upper apartments each urinal should have a small reservoir sufficient to contain a supply for the night

I would also advise that each night closet be furnished with one of Moule's self-acting earth closets It is possible that they may not often be used, but they will certainly occasionally be in demand, and in such a climate as that of Ootacamund great risk would be incurred by the boys leaving their warm beds at night to go down to the general latrines.

That part of the room occupied by the urinal and night closet should also have a flooring of sheet lead or zinc to protect the floor from accidental fouling Indeed the rooms are so small that an entire flooring of this kind with a hole and discharge pipe—for the convenience of occasional washing—leading to the discharge pipe from the urinal and communicating with the drains would not be costly These discharge pipes must, of course, be properly trapped and ventilated to prevent any sewage gases rising up through them.

13 I have felt reluctant, in the present aspect of the finances of the Empire, to recommend the adoption of any measures leading to expense, but I really think that the provision of water supply and sewerage upon the principles recommended will in the end be found the most economical by admitting of a reduction of the conservancy establishment of the institution—a question of some moment at a station where wages are so high. Mr Bliss informs me that at present the Conservancy Establishment costs Rupees 63-10 6 a month for the boys' branch, and Rupees 19 for the girls', and that after amalgamation of the Madras Establishment, it will probably rise to Rupees 127-5-0 for the boys', and Rupees 95 for the girls', giving a total of Rupees 223 per mensem, or Rupees 2676 per annum, which capitalized at five per cent represents Rupees 3520.

The provision of earth and removal of the soiled earth and excrement from the latrines which now require the maintenance of two carts and two pairs of bullocks, and which will probably rise to four carts and four pairs of bullocks when the institution is fully occupied, represent a great amount of labour and cost.

The proportion that the soiled excreta to be deodorized and removed, bear to the liquid waste, has been estimated at about 1 to 196, and it becomes an important question whether it would not be in the end—considering the great facilities that exist for carrying out the system of sewerage by water carriage on the plateau upon which the Asylum is built—more economical to admit the solid excreta also into the sewers; to convert, in fact, the present earth latrines into water closets—not the ordinary "pull" closets, but the trough system with an arrangement for the discharge of its contents into properly trapped sewer pipes, upon the plan represented in Plate XX. "Suggestions for improving Indian Stations." Tubular drainage for removal of all liquid sewage must, I consider, be adopted, and with the advantages of

out-fall and gradient it would certainly be more economical to admit the solid excreta also, than to treat them upon the dry-earth system. The Government are aware that the Sanitary Commission to the Home Government have in their Memorandum, published in Proceedings of Government, Public Department, No. 723, of 31st May last, on receiving my report upon the dry-earth system of sewage, strongly recommended the system of sewage by water carriage, and as regards the climate of Ootacamund, and the physical features of the plateau upon which this institution is built, I quite think that a preference should be given to that system, and that it would afford a good opportunity of practically testing it. That it would save a large monthly expenditure there is no doubt I would, therefore, suggest, for the consideration of Government, that this institution be provided with a water supply and drainage upon the system followed at Home, that the sewerage be kept distinct from the storm-water drainage, and the sewage be utilized in garden cultivation.

APPENDIX

Statement of cost of Conservancy of Lawrence Asylum, Ootacamund

BOYS' BRANCH.

At present	RS	A.	P.	*After amalgamation of Madras and O. L Asylum*
Monthly cost of removing refuse water and contents of Latrines and Urinals.				
Two Scavengers at Rupees 9 per month	18	0	0	
Part of one man's time at Rupees 8, say	4	0	0	
Interest of capital expended on Bullocks two pairs, at Rupees 160 each pair, = Rupees 320, this at ten per cent per annum is per mensem .	2	10	6	After amalgamation say double cost.
Maintenance of Bullocks per mensem	39	0	0	
	63	10	6	Rupees 127 5 0

GIRLS' BRANCH

At present.	RS	A	P.	*After amalgamation.*
Monthly cost of providing water and removing refuse water and contents of Latrines, &c.				
One man and two women, total	19	0	0	Half as much again as the present service for the boys, say—

	RS.	A.	P.
	95	7	9
Total ..	222	12	9

15th November 1869.

(Signed) T. BLISS.

(True Extract)

(Signed) J. L. RANKING,
Sanitary Commissioner for Madras

No. 10. ORDER THEREON, 4th January 1870, No. 5.

In the foregoing letter the Sanitary Commissioner draws attention to the water supply, drainage, and general conservancy of the Lawrence Asylum at Lovedale on the Neilgherries, and submits his remarks and suggestions thereon.

2. In paragraphs 1 to 5 he describes the present source of water supply, and suggests that the following arrangements should be adopted for the preservation and distribution of the same —

1*st.*—That the impounding reservoir should be strictly conserved, the gathering grounds be kept free from the intrusion of cattle, and especially from cultivation or the growth of rank vegetation.

2*nd.*—That the water should be conveyed by pipes to the reservoir, whence it should be raised to the plateau for distribution.

3*rd*—That on the plateau should be constructed a filter and covered clear-water cistern, and the water distributed from it to all parts of the Asylum by pipes.

4*th.*—That for bathing and swimming, arrangements should be made at the small artificial lake at the foot of the plateau.

3. In respect of a Laundry Establishment the Sanitary Commissioner thinks that if such an establishment be attached to the Asylum, the most suitable site for it would be at the end of the artificial lake above referred to.

4. The other recommendations of the Sanitary Commissioner are—that for the improvement of the *Lavatories*, water should be let into them by pipes and cocks, that the basins should be furnished with holes, plugs, and waste pipes; that the pipe for supply and branch pipes should be of iron, that with a view to the boys performing their ablution in privacy small cisterns should be built at either end of the building, enclosed by a low screen, and that the cisterns should be furnished with discharge pipes communicating with the general drainage system.

LIQUID REFUSE —That provision should be made for its removal by a system of under-ground drainage by glazed earthen-ware pipes, of the description known as Jenning's patent chair and saddle-pipes

URINARIES —That pipes should be laid on in connexion with the water supply, admitting of a continuous flow of a small stream of water into the urinals

NIGHT CLOSETS —That each closet should be provided with a urinal similar to those in use in the general urinary, and supplied with water and waste-pipe leading to the closed drains, with the addition of one of Moule's self acting earth closets, and that the flooring of the night closet, occupied by the urinal, should be of sheet lead or zinc.

SEWERAGE.—That the sewerage be kept distinct from the storm-water drainage, and the sewage be utilized in garden cultivation.

5. The Governor in Council approves generally of the foregoing suggestions and recommendations of the Sanitary Commissioner which are founded on sanitary principles approved by the best authorities on the subject in England; but before passing orders on them, the Governor in Council resolves to refer the Commis-

sioner's letter, through the Public Works Department, to Colonel Farewell, the Executive Engineer, with a request that he will furnish approximate estimates of the cost of giving effect to Dr. Ranking's proposals.

(True Extract.)

Acting Chief Secretary.

To the Public Works Department.
„ Sanitary Commissioner.
„ Director of Public Instruction.

Ed. J. Wright.

No 240

Communicates Temple
the Supt by 2d letter 4th
Division & Colonel
Farewell who will
submit the requisite
approximate estimates

Fort St George
21st Jany 1870

The Supt by 7th

Dept 22/1/70.

Cuc 158

Govt. of {1870} Madras.

PUBLIC WORKS.

Further Rec'd 26 Feb 70

To The Superintending Engr
1st Division

Rated
Recd
Encl

G. O. 2nd Jany 1870, No 240

Nos. 168-164

Lawrence Asylum at Lovedale

Rec. Public Dept. forwarding orders on the letter from the Sanitary Commissioner drawing attention to the water supply, drainage, and general conservancy of the Lawrence Asylum at Lovedale, Coimbatore Dt, and submitting his remarks & suggestions thereon. Cond. Chief Engr. amend